

Remarks

By the present amendment, claims 16 and 30 have been cancelled and the limitations of claims 16 and 30 have been incorporated respectively in claims 15 and 29. Below is a discussion of the rejection of claims 1-37.

Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over Taylor et al. '147, in view of Lundstrom et al., Mendenhall et al., and Ryobo et al.

Claim 1 recites a gas generating material for use in a vehicle occupant protection apparatus that comprises about 5% to about 20% by weight of the gas generating material, of a binder, 0 to about 50%, by weight of the gas generating material, of an energetic fuel; and an amount of oxidizer effective to oxygen balance the gas generating material. More than 50% by weight of the oxidizer is basic copper nitrate and the binder comprises at least about 20% by volume of the gas generating material.

Claim 1 is patentable over Taylor et al. '147, in view of Lundstrom et al., Mendenhall et al., and Ryobo et al. because Taylor et al. '147, in view of Lundstrom et al., Mendenhall et al., and Ryobo et al. do not disclose or suggest that the binder comprises at least about 20% by volume of the gas generating material.

As noted in the Office Action, Taylor et al. '147 teach a gas generating composition that includes a solvent soluble binder, a fuel component, and an oxidizer. (Column 5, lines 13-18). The oxidizer can comprise basic copper nitrate.

Taylor et al., however, do not teach or suggest that the binder comprises at least about 20% by volume of the gas generating material. Taylor et al. only teach that the amount of binder can comprise 5% to about 15% by weight of the gas generating material. This weight percentage neither discloses nor suggests the volume percentage.

Lundstrom et al. teach a gas generating composition that includes a nitrogen containing fuel and an oxidizer that can include basic copper nitrate. A binder can be included in the gas generating composition in an amount of about 2.0% to about 4.0%. Lundstrom et al., however, do not teach or suggest that the binder comprises at least about 20% by volume of the gas generating material.

Mendenhall et al. teach a gas generating composition that includes a fuel component, basic copper nitrate, and a metal oxide. Mendenhall et al., however do not teach or suggest the inclusion of a binder in the gas generating composition. Therefore, Mendenhall et al. cannot be relied on to teach or suggest the limitation that the binder comprises at least about 20% by volume of the gas generating material.

Ryobo et al. teach a gas generating composition comprising a fuel, a binding agent, and optionally an oxidizer. The binder is preferably included in the gas generating composition in an amount of about 3 to about 10 parts by weight with respect to the fuel. Ryobo et al., however, do not teach or suggest that the binder comprises at least about 20% by volume of the gas generating material.

Thus, none of the prior art references cited in the Office Action, either alone or in combination teach or suggest that the binder comprises at least about 20% by volume of the gas generating material. Therefore, the prior art fails to teach all of the limitations of claim 1.

To overcome this deficiency in the rejection, the Office Action argues that the recited % limitation of the binder would be not be unexpected. The Office Action states that with heavy or dense oxidizers such as metal oxides and copper compounds, these would provide a small volume amount due to their density, so the binder would have a relatively large portion.

Regardless of this explanation, the Office Action fails to disclose or suggest that this volume would be over 20%. Further, the Office Action assumes that one skilled in art would select compounds for the gas generating material that would optimize the binder volume. Neither the prior art nor the Office Action provide any motivation to make this combination or to suggest such a combination.

Additionally, the Office Action fails to provide any factual basis to support its broad conclusory statement that heavy or dense oxidizers, such as metal oxides and copper compounds, would provide a small volume amount due to their density and the binder would have a relatively large volume portion. Accordingly, the Office Action's assertion is mere speculation at best. It is well settled that speculation without factual basis is insufficient to support an obviousness rejection. Thus, without some factual basis in support of its assertion, the Office Action has failed to establish a prima facie case of obviousness. Therefore, withdrawal of the rejection of claim 1 is respectfully requested.

Claims 2-14 depend either directly or indirectly from claim 1 and therefore should be allowable for the same reasons as claim 1 and for the specific limitations recited in claims 2-14.

Claim 15 contains limitations similar to claim 1 and therefore should be allowable for the same reasons as claim 1 and for the specific limitations recited in claim 15.

Claims 17-28 depend either directly or indirectly from claim 15 and therefore should be allowable for the same reasons as claim 1 and for the specific limitations recited in claims 17-28.

Claim 29 contains limitations similar to claim 1 and therefore should be allowable for the same reasons as claim 1 and for the specific limitations recited in claim 29.

Claims 31-33 depend either directly or indirectly from claim 29 and therefore should be allowable for the same reasons as claim 29 and for the specific limitations recited in claims 31-33.

Claim 34 recites an extruded solid composite gas generating material for use in a vehicle occupant protection apparatus that comprises about 5% to about 20% by weight of the gas generating material, of a mixture of cellulose acetate butyrate and butyl nitratroethylnitramine, 0 to about 50%, by weight of the gas generating material, of an energetic fuel with a low heat of heat of combustion; and an amount of oxidizer effective to oxygen balance the gas generating material. More than 50% by weight of the oxidizer is basic copper nitrate.

Claim 34 is patentable over Taylor et al. '147, in view of Lundstrom et al., Mendenhall et al., and Ryobo et al. because Taylor et al. '147, in view of Lundstrom et al., Mendenhall et al., and Ryobo et al. do not disclose or suggest a binder comprising a mixture of cellulose acetate butyrate and butyl nitratroethylnitramine.

As noted above Taylor et al. '147 teach using a binder, but not a mixture of cellulose acetate butyrate and butyl nitratroethylnitramine. Lundstrom et al. teach the use of cellulose acetate butyrate, but not cellulose acetate butyrate in combination with butyl nitratroethylnitramine. Mendenhall et al. do not teach using a binder in the gas generating composition of Mendenhall et al. Ryobo et al. teach the use of cellulose acetate butyrate, but not cellulose acetate butyrate in combination with butyl nitratroethylnitramine. Thus, none of the prior art references teach or suggest the binder of claim 34. Therefore, withdrawal of the rejection of claim 34 is respectfully requested.

Claims 35-37 depend either directly or indirectly from claim 34 and therefore should be allowable for the same reasons as claim 34 and for the specific limitations recited in claims 35-37.

In view of the foregoing, it is respectfully submitted that the above-identified application is in condition for allowance, and allowance of the above-identified application is respectfully requested.

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Please charge any deficiencies or credit any overpayment in the fees for this amendment to our Deposit Account No. 20-0090.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Richard A. Sutkus', written over a horizontal line.

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